Remarks/Arguments

The above Amendments and these Remarks are in reply to the Action mailed August 22, 2003. Claims 1-14 were pending in the Application prior to the outstanding Action. In the Action, the Examiner rejected claims 1-14. The present Response cancels claims 5, 12 and amends claims 1, 4, 8, and 11.

Claim 14 is amended to correct an issue of format by adding the term "and" after the second clause in the claim.

In the Action, the Examiner rejected claims 1, 4, 8,and 11 under 35 USC 112, second paragraph, referring to the use of the term "adapted to" as rendering the claims vague and indefinite thereby. The claims have been amended to delete the term, with the resultant claim language reflecting the standard means-plus-function format.

Claims 1-14 were rejected under 35 USC 103(a) as unattainable over Drew, et al. (US 5,313,061) in view of Grilletto, et al. (US4,260,886) or Seidenberg, et al. (US 3,700, 893) and Johnston et al. (US 5,404,747).

Applicant respectfully submits that the apparatus described by Drew et al. (hereafter '061) has a front end to a mass spectrometer (MS) that is distinctly different from the front end to an MS described in the instant application. This is evident from the design of the apparatus described in '061, where the front end to the MS is described as element 12, the sample inlet and concentrator, and element 14, the gas chromatograph (GC) of Fig.1, and shown in detail in Fig. 14. GC is a separation technology based on the partitioning of a solute in the gas phase between a stationary solid or liquid phase. In that regard, in order to keep the species to be analyzed volatile, the column temperatures in the GC unit are generally held between 50-150 °C. Additionally, the sample inlet and concentrator must be heated to keep the species analyzed from condensing in the front end, and hence never analyzed. The constant flow of an inert carrier gas to move the species through the front end is also required for the front end of '061, and so the front end of the '061 is maintained at 1 atmosphere. The complication of having a front end at one atmosphere with a carrier gas flow going into an MS requiring a vacuum of about 10^{-6} atmospheres is an interface issue between the front end and the MS of '061 that has to be addressed in such a system.

In contrast, what is disclosed in the instant application is a front end specifically designed for contaminant analysis of large assembled structures, for which a specially designed housing and chamber

are described as the front end to an MS analyzer. The housing and chamber of the disclosed apparatus are distinct from the front end of '061 that consists of a sample inlet and concentrator, and a GC. In the instant application, the outgas contaminants from the surface of the sample are drawn into the evacuated chamber, and then directly into the MS, so the front end of the instant application is under vacuum, unlike the front end of '061, which is at 1 atmosphere. Further, no separation, and design complexity thereof, is required of the outgas sample in the disclosed apparatus. Specifically, paragraph 22 of the instant application states:

> As is apparent, one advantage of the inventive device is its simplicity. The portable device does not require means for separating one or more gas components from the gaseous material in the chamber prior to being analyzed in the mass spectrometer. Specifically, outgas to be analyzed does not travel through a separation chamber where one or more gaseous components are removed before the sample enters the spectrometer.

In that regard, '061 is not only significantly different in design and function as a front end to an MS, but teaches away from the simplicity of design and function of the disclosed apparatus.

The Action states that the secondary references, Grilletto, et al. (US4,260,886; hereafter '886) or Seidenberg, et al. (US 3,700,893; hereafter '893) further teach that a sample gas can be compared to a standard gas. Both '886 and '893 teach the use of an external calibrating gas. None of these secondary references cure the deficiencies of '061. Additionally, what is taught in the instant application is the use of an internal calibration, by virtue of analyzing a clean area of the sample. For the purpose of analyzing contaminants adsorbed on large surface, there is no motivation to combine the complex front end of '061, consisting of sample inlet and concentrator and a GC, and the use of an external calibrating gas of '886 or '893, and either singly or in combination, the cited references would not reach what is disclosed in the instant application.

Further, the action states that '061 could be combined with Johnston et al. (US 5,404,747; hereafter '747) for analyzing surface contaminants of large structures. What is described in '747 is an apparatus for detection of leaks around sealed gaps, most notably the doors of airplanes. Airplanes have to be sealed against reduced pressures in the range of 0.4 to 0.7 atmospheres, while the disclosed apparatus is maintained under high vacuum. (See paragraph 20, for description of the pump, 14, of the instant apparatus: "...a turbo pump from Pfeiffer Vacuum, Nashus, N.H. (model TMV 180 HM)." NOTE: product description for this pump is to create final pressures of $< 1 \cdot 10^{-7}$ atmospheres). In that regard, what is disclosed in '747 teaches away from the design of the disclosed apparatus, which is maintained at

high vacuum. There is no motivation to combine the complex front end of '061 at one atmosphere, with the interface of '747 at fractions of atmospheres to reach the disclosed apparatus under high vacuum.

In light of the above, it is respectfully submitted that all of the claims now pending in the subject patent application should be allowable, and a Notice of Allowance is requested. The Examiner is respectfully requested to telephone the undersigned if she can assist in any way in expediting issuance of a patent.

Respectfully submitted,

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